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ABSTRACT

Information is presented on the composition of the 1979 membership of the American Institute of Physics (AIP). Questionnaires were administered to members of the nine independent societies of the AIP to determine demographic and employment information. Background characteristics of the membership include the following: more than half identify themselves as physicists; Ph.D.s predominate among the membership; only 5 percent are females; only 8 percent are members of specified minority groups; nearly 90 percent are employed full-time; and slightly more than half are nonacademically employed with industry being the predominant nonacademic employer. Information on type of employment by degree received is also presented. While research, both basic and applied, is the major work activity, many are also involved in teaching, development, design and engineering, and administration. Nearly two-thirds of AIP society members are currently working in physics and astronomy. Information is also presented on subfield of current work and correlated to highest degrees. After salary data, comparisons are made between the nine societies on selected characteristics. The nine societies comprising the AIP are: American Physical Society; Optical Society of America; Acoustical Society of America; The Society of Rheology; American Association of Physics Teachers; American Crystallographic Association; American Astronomical Society; American Association of Physicists in Medicine, and American Vacuum Society. (SW)

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AIP report MANPOWER STATISTICS DIVISION

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AIP
ED193985

AIP MEMBER SOCIETIES ENTERING THE 1980's

Beverly Fearn Porter

IR 013174

American Physical Society
Optical Society of America
Acoustical Society of America
The Society of Rheology
American Association of Physics Teachers
American Crystallographic Association
American Astronomical Society
American Association of Physicists in Medicine
American Vacuum Society

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To this end the Institute publishes scientific journals; provides abstracting and indexing services; serves the public by making available to the press and other channels of public information reliable communications on physics and astronomy and their progress; carries on extensive manpower activities; encourages and assists in the documentation and study of the history and philosophy of recent physics; cooperates with local, national, and international organizations devoted to physics and related sciences; and fosters the relations of the science of physics to other sciences and to the arts and industries.

The Manpower Statistics Division provides reliable information on the composition and dynamics of the scientific labor force and educational system to the physics community for use in self-assessment. Its program involves regular data collection and analysis; information dissemination and report publication; advising internal, society, and national groups on survey instrument design; and aiding in the development of statistically relevant and efficiently organized data bases.

Member Societies
The American Physical Society
Optical Society of America
Acoustical Society of America
The Society of Rheology
American Association of Physics Teachers
American Crystallographic Association
American Astronomical Society
American Association of Physicists in Medicine
American Vacuum Society

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INTRODUCTION

The nine Member Societies and their nearly 60 000 members have moved into a new decade, a decade with the promise and the problems of a steady-state environment. For six of the societies this will be their sixth to ninth decade of existence: The American Physical Society and the American Astronomical Society founded in 1899, followed by the Optical Society of America in 1916, the Acoustical Society of America and The Society of Rheology in 1929, and the American Association of Physics Teachers in 1930. The remaining three emerged, in their present form, after World War II: The American Crystallographic Association in 1949, the American Vacuum Society in 1953, and finally the American Association of Physicists in Medicine in 1958. Each decade has presented opportunities which the societies have explored and problems which they have weathered; this new decade will be no exception.

The nine societies differ in their size, their composition, and the directions of their primary interest. Yet they are united in their commitment to furthering the advance of science and technology, both in physics and related disciplines.

Since it is the membership of these societies who will produce many of the advances of the 1980's and the ensuing decades, this report concentrates on them, in concert, and in their specific societal affiliations.

In the spring of 1979, the AIP Manpower Statistics Division conducted a short, one-page survey of a small random sample of the U.S. membership of the nine Member Societies.[1] A single questionnaire wave brought a 61% response.[2] The questions asked were basically demographic and employment oriented: sex, age, citizenship, employment status, employer, work activity, income, etc.

The following pages of text, tables, and graphs describe the composition of the 1979 society membership in two sections: Sec. I examines the membership of all the AIP Member Societies together, Sec. II presents some selected data which may be of interest in comparing the different societies.[3] Tables provide supplementary detail.

In future reports, comparisons of this data with additional information being obtained this year and later in the 1980's, will be made and should present the societies with a picture of the changing trends in their membership. Although similar trend data from the past is not available for most societies, in those cases where some material is available it will also be included in future reports.

[1]Approximately 14% of the membership are foreign members, living abroad. They were not contacted in this preliminary sample survey.
[2]The response rate varied only somewhat by society ranging from a high of 65% to a low of 54%.
[3]Further detail on the membership of each society has been forwarded to that society's office.

I. TOTAL MEMBERSHIP

Background Characteristics

The total membership of the nine AIP Member Societies reflects considerable diversity, as indicated in Figs. 1 and 2 and Tables I and II.[1] While more than half of the society members identify themselves as physicists, a broad spectrum of other scientists and engineers are also represented, making up a full 40% of the membership. It may be noted from Table I that nearly one out of every five society members identifies him or herself as an engineer. The members received their highest degrees in a variety of subfields with the major ones being Solid State Physics, Nuclear Physics, Elementary Particles, General Physics, Astronomy and Astrophysics, and Electrical and Electronic Engineering. Two-thirds of those with research degrees classified themselves as experimentalists.

Ph.D.'s predominate among the society membership (Fig. 1); however, a substantial number of master's and bachelor's degree holders are also in evidence. Belying any image of scientific societies as bastions only of the older scientist, Fig. 2 reveals that most society members received their highest degrees during the past two decades—over 40% in the 1970's.[2] Excluding the advanced graduate students, who made up approximately 10% of the membership, Table IV examines the year of degree for society members at each degree level. Ph.D.'s were more likely than the nonstudent master's and bachelor's degree holders to have received their degrees in the past decade.

On the other background factors, however, the society members showed considerably less diversity, as Figs. 3 and 4 indicate. Only 5% of the society members are female; only 8% are members of specified minority groups. As outlined in Table V most of the minority

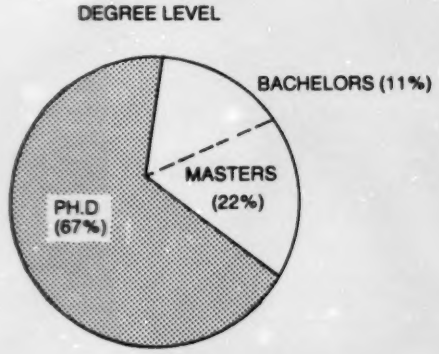


Fig. 1. Degree level.

[1] All Tables are listed in numerical order starting on p. 9

[2]45% of the society members were born 1940 or later. See Table III.

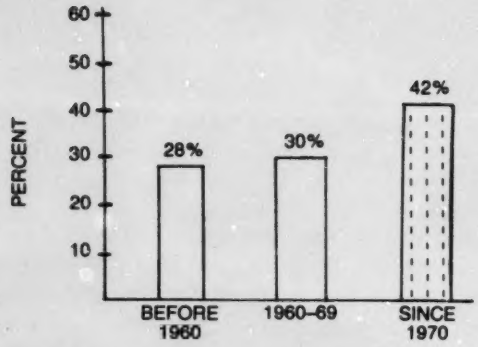


Fig. 2. Year of highest degree.

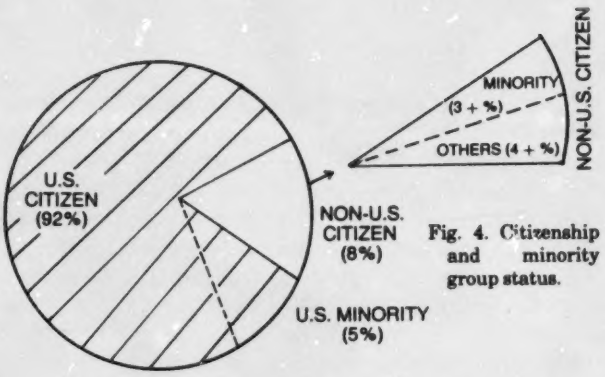


Fig. 4. Citizenship and minority group status.

group members are Oriental and other Asian, including both U.S. and non-U.S. citizens. Black, American Indian, and Hispanic groups, combined, make up less than 2% of the membership.

Employment Status

As Table VI indicates, nearly 90% of the society members are employed full-time. A very small percentage are unemployed, that is, not employed but seeking employment.[1] Those who are employed part-time and those who are not employed are primarily advanced graduate students or retired.

Employer

Slightly more than half of the society membership is nonacademically employed with industry being the predominant nonacademic employer (Fig. 5). Over 40% are employed by universities and four-year colleges.

By Degree

Where individuals are employed is primarily influenced by their levels of highest degree. Figure 6 and Table VII illustrate the varying patterns of employment, omitting advanced graduate students who are employed part-time in universities as teaching and research assistants. The Ph.D. society members, who represent two-thirds of all society membership, are nearly evenly split between academic and nonacademic employment. Those employed in academe are most heavily concentrated in the universities; those employed in nonacademic institutions are primarily found in industry with, however, a substantial proportion also employed in government installations and Federally Funded Research and Development Centers (FFR&DC). As illustrated in Fig. 7, the young Ph.D.'s are more likely than the older ones to be nonacademically employed.

Among the master's degree holders, the balance tips further towards nonacademic employment, and the nature of academic employment changes. Those in academe are more likely, than the Ph.D. society members,

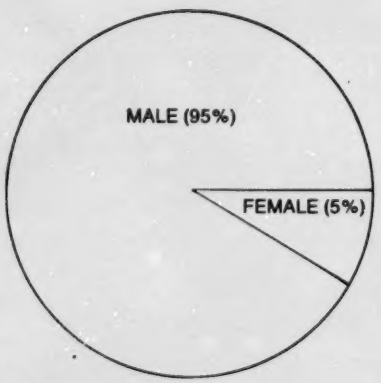


Fig. 3. Male and female society members.

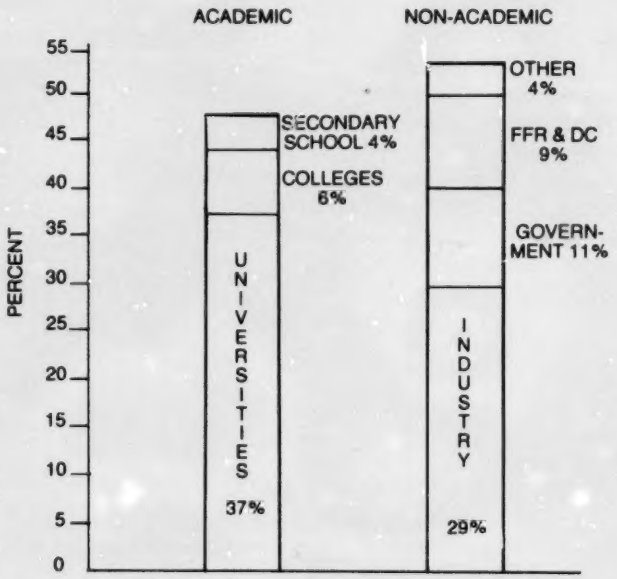


Fig. 5. Type of employers.

[1]The unemployment rate (number not employed and seeking/labor force) would be 1.6%.

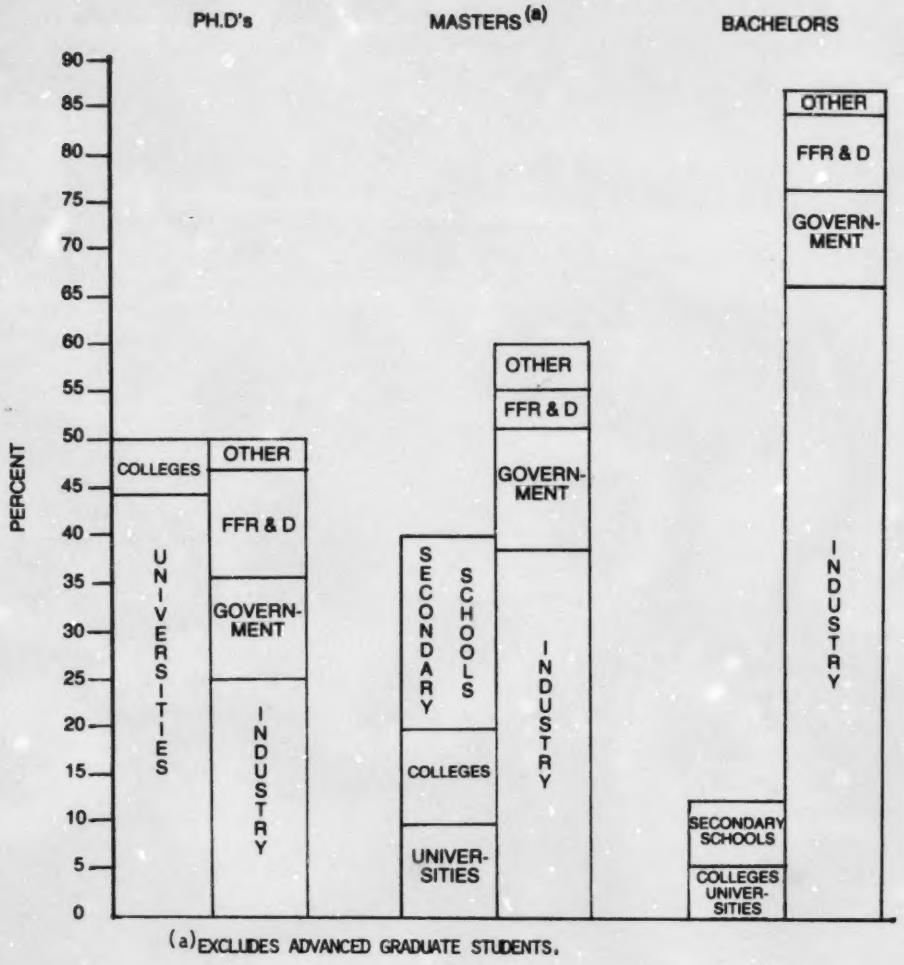


Fig. 6. Type of employer by highest degree.

to be employed in secondary schools and junior colleges. Those in the nonacademic sphere are more concentrated in industry and government and less in the FFR&DC's than the Ph.D.'s.

The bachelor's degree holders are most heavily concentrated in nonacademic employment, particularly industry.

By Professional Self-Identification

There is also some variation in type of employer by professional self-identification as illustrated in Fig. 8 and Table VIII. Those who identify themselves as astronomers are most likely to be academically employed; those who identify themselves as engineers are most likely to be employed outside of academe, particularly in industry. Physicists are evenly split.

By Sex

Although the number of women in the sample is small, the differences in employer distribution between male and female physicists is striking enough to be not-

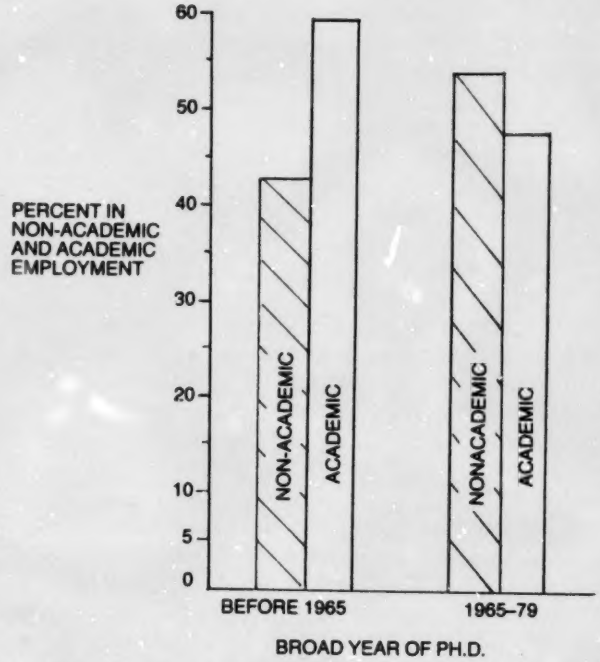


Fig. 7. Type of employer by broad Ph.D. cohort. Self-employed not included.

7

ed. As illustrated in Table IX, women physicists are more likely to be academically employed than male physicists. The major differences are in other academic employment (colleges and high schools) where twice as high a percentage of women are employed than men and industrial employment where approximately twice as high a percentage of men are employed than women.

Work Activities

Society members are involved in a broad variety of work activities as illustrated in Fig. 9. While research, both basic and applied, is the major work activity, a substantial number of society members are also involved in teaching, development, design and engineering, and administration.

An individual's primary work activity is heavily influenced by where he is employed, as indicated in Table X. In the academic areas, there is a clear difference between those employed at universities and in other academic institutions. Almost all of the latter group are primarily engaged in teaching, while at the universities there is a fairly even distribution between teaching and research. In industry the major activities are development and engineering followed by applied research. Only a small proportion are primarily involved in basic research. In government there is a greater emphasis on research with about one-third engaged in basic and another one-third in applied research. Research, however, is *most* predominant at the FFR&DC's with a somewhat heavier concentration on basic than applied research. The nonprofit organizations are the most diversified with one-quarter of the members employed there being involved in unlisted activities. Administration involves between 12% and 17% of those in the nonacademic sectors, a lower proportion in academe.

Of the Ph.D.'s employed in academe, over 60% are tenured, 15% are in a tenure line while nearly one-quarter are holding temporary postdoctoral or other nonfaculty academic positions.

Subfield of Current Work

Nearly two-thirds of AIP Society Members are currently working in physics and astronomy, down slightly from those who had received their degrees in these areas (see Table XI). Thirty percent are working in other science and engineering and five percent in non-science areas. Solid State is again the major physics subfield, although there has been outmobility since the degree. As Table XII illustrates, the subfields which have undergone major losses between degree and current work have been: Nuclear Physics, Atomic and Molecular Physics, Elementary Particles, and Solid State Physics. The subfields which have shown major increases between degree and current work have been: Medical Physics, Acoustics, Fluid Dynamics, Geophysics, and Optics. As Table XI details further, Astronomy, Biophysics, and Plasma Physics have remained stable.

By Highest Degree

The prior paragraph noted the broad variety of physics, engineering, and other science fields in which society members are currently working. What area an individual is involved in is strongly related to the level of his highest degree. Since three-quarters of the society members are Ph.D.'s or advanced graduate students on the way to the Ph.D., the previous discussion most heavily reflected their involvement.

As Table XIII indicates, nonstudent master's and bachelor's degree holders have a somewhat different pattern of involvement than their Ph.D. colleagues. They are somewhat less involved in physics, and more involved in engineering. The nature of the physics subfield involvement also differs. Master's degree holders are heavily involved in science education both at the secondary school and college level. The major substantive physics subfields in which the master's and bachelor's degree holders are involved are Acoustics and Optics. Few are found in such primary Ph.D. subfields as Elementary Particles, Astronomy, Astrophysics, or Nuclear Physics.

For all degree holders, Electronic Engineering is one

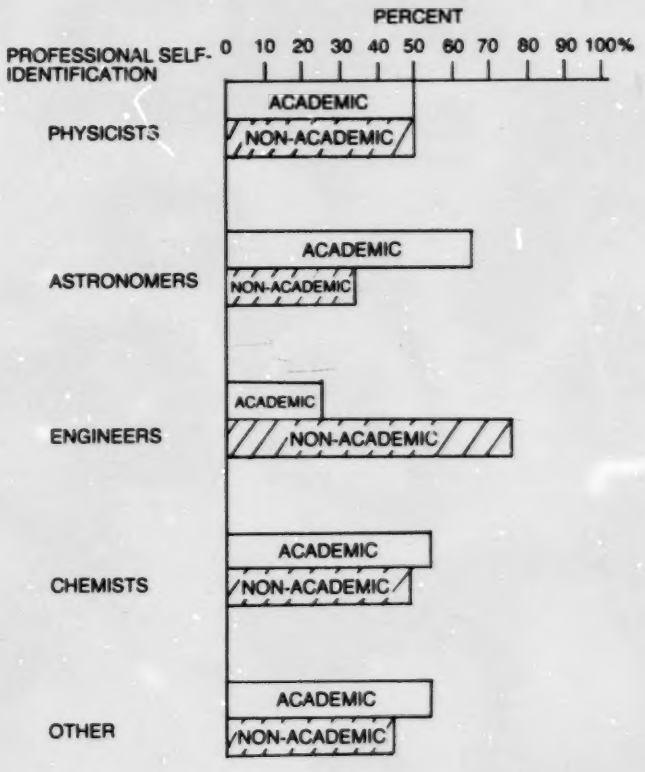


Fig. 8. Type of employer by professional self-identification.

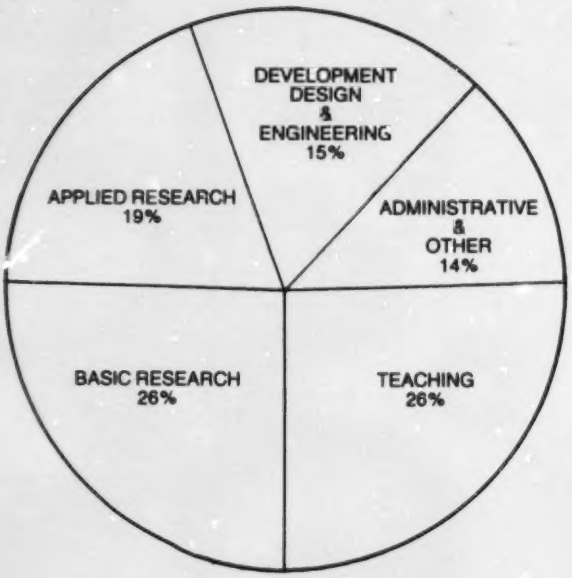


Fig. 9. Primary work activity.

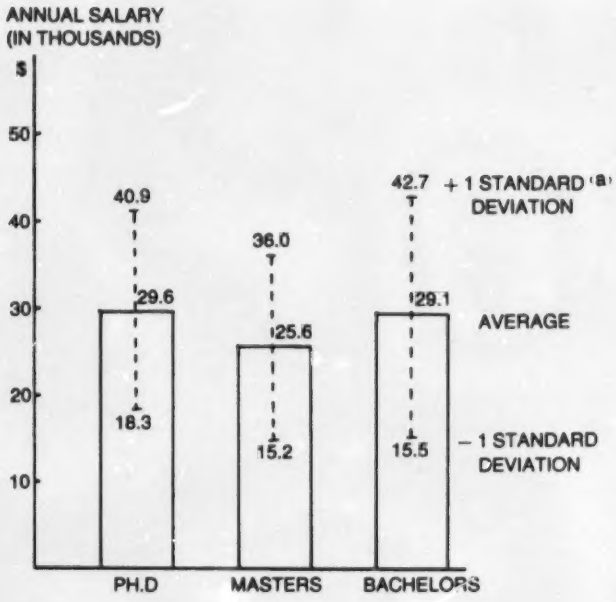
of the major engineering work areas. For master's degree holders, Systems Engineering is also central. In the related science areas, Chemistry is predominant among the Ph.D.'s, Computer Science and Statistics among the master's degree holders. At all three levels, there is involvement in Materials Science.

Salaries

Current salaries are affected by a variety of factors: level of highest degree, type of employer, years of experience, sex, etc. Frequently these factors are intertwined. The present sample is too small to enable a full untwining; however, it can present a broad picture of the basic salary structure which exists for society members.

As Fig. 10 indicates, in 1979 society members had average annual salaries of nearly $30 000 with most salaries ranging from the high teens to the low forties. The surprisingly high bachelors' salaries are due to two factors: their advanced age and their heavy concentration in industrial and government employment. The somewhat depressed master's degree salaries are due to their greater representation in colleges and secondary schools where salaries are the lowest.[1]

[1]As shown earlier in Table IV, more than half of the (nonstudent) bachelor's degree holders received their degrees before 1960 in contrast to one-third of the master's and one-quarter of the Ph.D.'s. Also, as Table VII details, 80% of bachelor's degree holders in comparison to half of the masters are employed in industry and government, where salaries are high. In contrast, one-third of the masters are employed in colleges and secondary schools where salaries are the lowest in comparison to 9% of the bachelors.



(a)Mean ± one standard deviation (S.D.), would cover 67% of the society members' salaries if salaries were normally distributed.

Fig. 10. 1979 average salary by level of highest degree.

Figure 11 examines average salary by years from degree for Ph.D.'s. (Master's and bachelor's degree holders were too diverse and too small in number in this sample

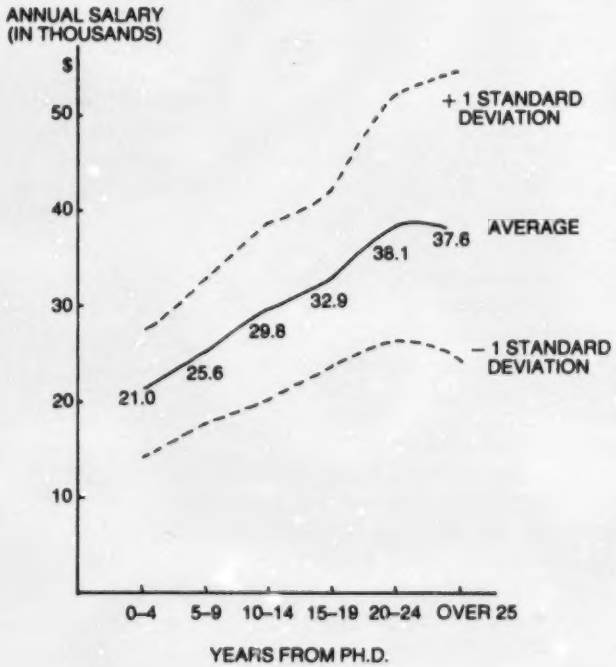


Fig. 11. 1979 annual salary by years from Ph.D.

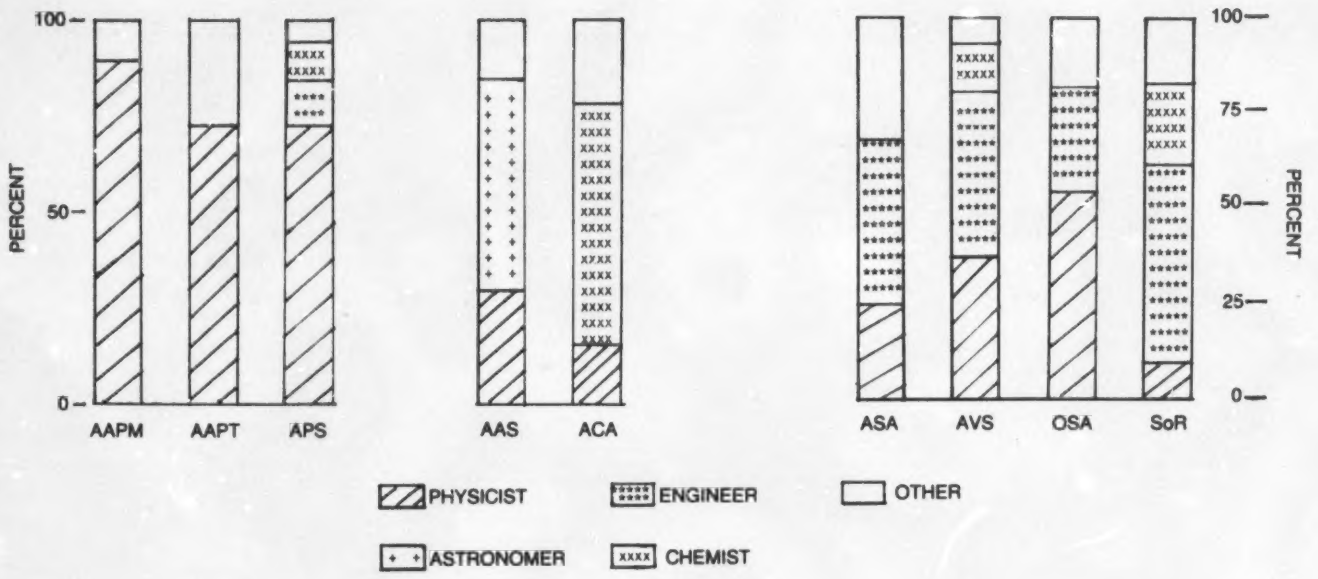


Fig. 12. Professional self-identification for members of each society.

to examine in further detail.) As the graph indicates, recent Ph.D.'s have average salaries around $21 000. The salaries gradually increased with experience, peaking and leveling under $40 000 for those with 20 and more years of experience. Variation in salaries also increases with time, particularly as some society members move into administrative career lines.

Table XIV presents the average salaries, both mean and median, by type of employer. Academic salaries, particularly in secondary schools and colleges are considerably below those in the various nonacademic areas. Government and industrial salaries are the highest with those in the FFR&DC's and nonprofit organizations being slightly lower. The mean salary for the small group of society members who are self-employed on a full-time basis is the highest of all. However, as the large disparity between the mean and median salary indicates salaries in this group are skewed with considerable variability present. Further salary detail is presented in Tables XV–XVII.

Summary

Diversity exists among the society members; professional self-identification, employer, work activity, subfield, salary—all show wide variation. While it is true that white male Ph.D.'s still account for the majority of society members, the activity of women, minorities, and master's/bachelor's degree holders also show their influence.

The rich diversity illustrated in the previous pages reflects both the varied nature of the physics-related science enterprise and the nine unique, independent (although sometimes overlapping in membership) societies which are affiliated with AIP. Section II will look at these societies, and what they bring to the science enterprise, in more detail.

II. COMPARISON OF AIP MEMBER SOCIETIES: SELECTED CHARACTERISTICS

While Sec. I examined the characteristics of society members across all AIP Member Societies, this section concentrates on making comparisons, in a few areas, between the nine societies. Although we are treating each of the societies separately, it should be noted that membership in one society is not exclusive of membership in another. A fair amount of overlap, that is multiple society membership, exists. As Table XVIII indicates, the extent of overlap varies by society. A relatively high percentage (36%) of the American Association of Physics Teachers members belong to one or more other AIP Member Societies, while only a small proportion (10%–15%) of the members of the Acoustical Society of America, the American Crystallographic Association, and The Society of Rheology indicate multiple membership.[1] The major societies with which overlap occurs are The American Physical Society, the American Association of Physics Teachers, and the Optical Society of America.

[1]Society members may, however, also hold membership in other, non-AIP, science and engineering societies. Such overlap is not examined here.

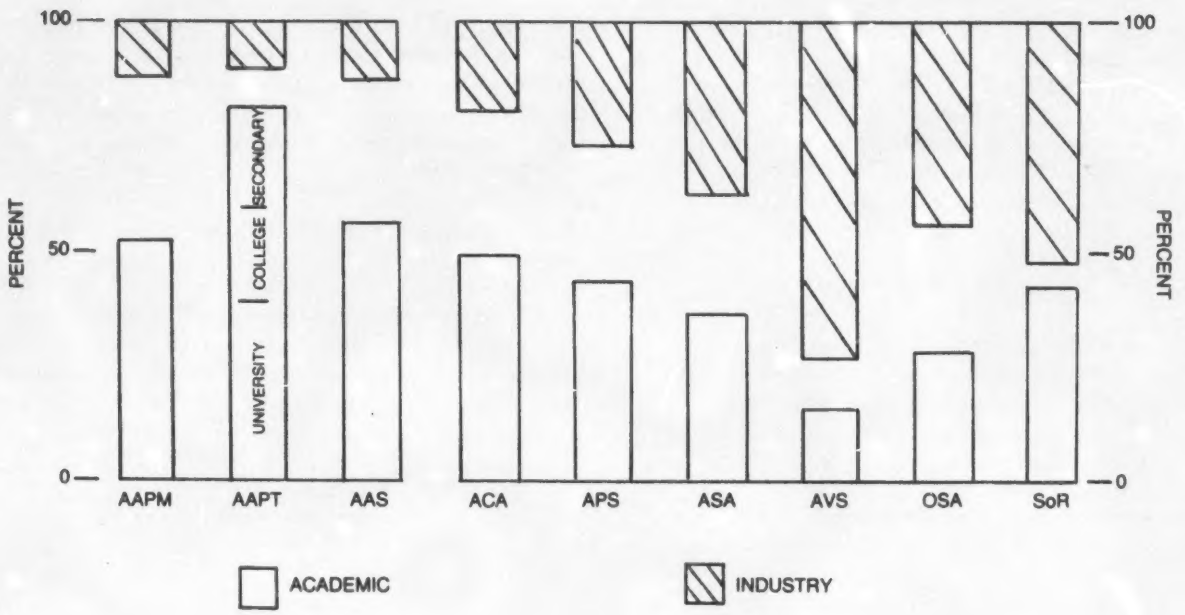


Fig. 13. Type of employer for members of each society.

Year of Highest Degree

As discussed in Sec. I, 42% of the society members received their highest degrees, Ph.D.'s, Master's, or Bachelor's, in the 1970's. As Table XIX indicates there was, however, variation by society. As might be expected the American Association of Physicists in Medicine, the fastest growing of AIP Member Societies, and the most recently founded, has the highest proportion of members receiving their degrees in the 1970's. The American Astronomical Society, another rapidly growing society, also has more than half of its members receiving their highest degrees during the past decade.

Professional Self-Identification[1]

Sample members were asked to indicate their major professional self-identification: physicist, astronomer, engineer, chemist, biologist, mathematician, other scientist, or other. As was indicated in Table I of the first section while more than half of the society members identified themselves as physicists, a broad spectrum of other scientists and engineers were also represented.

As Fig. 12 illustrates, the nine societies show considerable variation in their composition. Three-quarters or more of the members of the AAPM, the AAPT, and the APS consider themselves physicists. The APS also has a small but noticeable percentage of engineers and chemists among its members. The AAPT has a broad scattering of individuals from a number of professional areas. More than ten percent of the membership identify themselves as nonscientists; many of these individuals noted that they consider themselves general educators.

In two of the societies, the AAS and the ACA, over half of their members identify themselves with specified other scientific groups. Nearly 60% of AAS members consider themselves astronomers, in contrast to 30% who consider themselves physicists. In the ACA, the dominant group are chemists representing over 60% of the membership.

Finally, four of the societies have a substantial proportion of their membership who consider themselves engineers: The SoR with 60%, the AVS with 45%, the ASA with 44%, and the OSA with 30%. The AVS and The SoR also have a noticeable proportion of chemists among their members. One-fifth of the ASA members consider themselves "other scientists, not specified." Other inquiries suggest that most of these other scientists are psychologists and audiologists.

Each of the nine societies thus show different patterns of membership composition reflecting their major interest and involving a rich mix of physicists, related scientists, engineers, and nonscientists.

Type of Employer

In Sec. I, it was noted that half of the society members were academically employed and half were employed in a variety of nonacademic areas. As Fig. 13 and Table XX

[1]In each of these comparisons and discussions of individual societies, it should be kept in mind that the sample, although randomly selected, is small in absolute size. Some fluctuation in actual percentages thus may be expected, particularly for the smaller societies.

indicate, there is clear variation in type of employer among the nine member societies.

As might be expected, the AAPT has the heaviest academic concentration (81%). However, even within this society there are a number of members with nonacademic affiliations. The AAPT is also the only society which has a broad academic distribution, including members teaching at universities, four- and two-year colleges, and secondary schools. Few junior college or secondary school teachers belong to any of the other AIP Member Societies.

The members of the AAS and the AAPM are also primarily employed in academe (55% and 52%, respectively), but here the concentration is primarily in the universities. The major nonacademic employer for AAS members is the government; for AAPM members it is the nonprofit organizations, primarily hospitals.

The large APS and the relatively small ACA are almost evenly split between academic and nonacademic employment with a slightly higher nonacademic component than those societies previously discussed. In both cases university employment is predominant among the academics and industrial employment among the nonacademics, although members working for the government and, in the APS, the FFR&DC's are also well represented.

Members of the remaining societies are more heavily based in the nonacademic sphere, with approximately two-thirds of SoR, ASA, and OSA members and over 80% of AVS members thus employed. For each of these societies industry was the major nonacademic employer; the ASA and the OSA also had a substantial number of their members in government

While the nine member societies could be compared on a variety of other dimensions, those discussed in this section seemed to be of most general interest. Further detail is available on request.

TABLES

TABLE I. Professional self-identification.

	No.	%
Physicist	1509	60
Engineer	422	17
Chemist	231	9
Astronomer	96	4
Other Scientist	166	7
Other	96	4
Total known	2520	
No response	6	

TABLE II. Major subfields of degree.

	No.	%
PHYSICS AND ASTRONOMY	1745	71
Solid State Physics	284	
Nuclear Physics	227	
Elementary Particles	158	
General Physics	152	
Astronomy and Astrophysics	141	
Atomic and Molecular Physics	133	
Chemical Physics	95	
Plasma Physics	84	
Optics	82	
Low Temperature Physics	55	
Physics Education—Precollege	54	
Acoustics	51	
Mathematical Physics	36	
Physics Education—College	30	
Biophysics	29	
Medical Physics	28	
Crystallography	22	
Fluid Dynamics	20	
Other Physics	113	
ENGINEERING	288	12
Electrical	79	
Electronic	61	
Mechanical	55	
Nuclear	21	
Aeronautical and Astronautical	19	
Chemical	18	
Other Engineering	35	
OTHER SCIENCE	306	12
Chemistry	136	
Materials Science	37	
Psychology	37	
Math and Statistics	30	
Earth and Environmental	14	
Biological Science	14	
Other Science	38	
NONSCIENCE	33	1
Total known	2465	
No response	61	

TABLE III. Age distributions.

Year of birth	No.	%
1950 +	266	18
1940–1949	826	26
1930–1939	686	16
1920–1929	458	24
Before 1920	238	16
Total known	2470	100

TABLE IV. Level of highest degree by years of highest degree.

Year of highest degree	Level of highest degree		
		Nonstudent	
	Ph.D.'s % (No.)	Masters % (No.)	Bachelors % (No.)
Before 1960	26	36	58
1960–69	34	31	21
1970 +	40	33	21
Total known*	100 (1656)	100 (396)	100 (201)

*31 Ph.D.'s, 10 masters, and 7 bachelors did not indicate years of degree.

TABLE V. Race and minority status by citizenship.

Race and minority status	Citizenship			
	U.S. number	Non-U.S. number	Total number	%
White	2171	100	2271	91.2
Oriental and other Asian	86	78	164	6.6
Black, American Indian, and Hispanic	34	2	36	1.4
Other	14	4	18	0.7
Total known	2305	184	2489	

TABLE VI. Employment status.*

	No.	%
Employed full-time	2185	87
Employed part-time	158	6
Not employed, not seeking	139	6
Not employed, seeking employment	37	1
Total known	2519	100

*Approximately one-third of the not employed group and one-half of the part-time employed group are advanced graduate students.

TABLE VII. Type of employer by highest degree.

	Ph.D.'s		Masters[a]		Bachelors[a]	
	No.	%	No.	%	No.	%
ACADEMIC	807	50	150	40	22	13
University	715	44	33	9	7	4
College[b]	84	6	38	10	1	1
Secondary school	8	—	79	21	14	8
NON-ACADEMIC	816	50	228	60	151	88
Industry	403	25	144	38	114	66
Government	175	11	57	15	20	12
FFR&DC	192	12	13	3	12	7
Other	46	3	14	4	5	3
Total known	1623		378		173	
No response	64		31		11	

[a]Advanced graduate students are not included.
[b]Most of the Ph.D.'s employed in colleges (90%) are to be found in the four-year colleges, most of the masters (60%) in the two-year colleges.

TABLE VIII. Type of employer by professional self-identification.

Employer	Physicists %	Astronomers %	Engineers %	Chemists %	Other Scientists %	Other %	Total %
ACADEMIC SUBTOTAL	50	66	25	52	54	56	47
University	39	58	22	45	43	15	37
Other Academic	11	8	3	7	11	41	10
NONACADEMIC SUBTOTAL	50	34	75	48	46	44	53
Industry	24	9	59	29	20	29	29
Government	12	16	7	7	16	3	11
FFR&DC	12	3	4	11	6	—	10
Nonprofit and other	2	6	5	1	4	12	3
Total known (number)	1396	87	400	218	158	95	2354
No response	113	9	22	13	8	1	66

TABLE IX. Type of employer by sex.

	Male %	Female %
ACADEMIC	46	61
University	36	42
Other academic	10	20
NONACADEMIC	54	39
Industry and self-employed	30	16
Government	11	11
FFR&DC	10	9
Nonprofit organization and other	3	2
Total known employer	2226	122

TABLE X. Type of employer by principal work activity.

	Universities %	Other academic %	Industry %	Government %	FFR&C %	Other %
Teaching	45	91	—	—	—	3
Basic research	39	—	11	32	43	25
Applied research	9	1	30	31	35	19
Development and Engineering	1	—	38	12	10	17
Administration	4	6	15	17	12	12
Other	2	1	7	8	—	25
Total known	861	234	687	260	223	77

TABLE XI. Subfields of degree and work.

	Degree subfield	Subfield of current work
PHYSICS AND ASTRONOMY		
Astronomy	54	57
Astrophysics	88	65
Acoustics	51	90
Atomic and Molecular Physics	133	64
Biophysics	29	28
Chemical Physics	95	69
Crystallography	22	16
Electromagnetism	17	15
Electronics	19	23
Elementary Particles and Fields	158	81
Fluid dynamics	20	32
Geophysics	15	23
High Polymer Physics	15	13
Low Temperature Physics	55	23
Mathematical Physics	36	25
Mechanics	9	5
Medical Physics	28	66
Nuclear Physics	227	95
Optics	82	118
Plasma Physics	84	86
Rheology	4	11
Thermal Physics	5	6
Solid State Physics	284	163
Vacuum Science	6	24
Physics, general	152	62
Physics Education, precollege	54	61
Physics Education, college	30	127
Physics, other	23	27
ENGINEERING		
Aeronautical and Astronautical	19	25
Chemical	18	16
Electrical	79	33
Electronic	61	56
Environmental	—	12
Mechanical	55	36
Nuclear	21	29
Systems	3	41
Engineering, general	6	19
Engineering, other	26	41
OTHER SCIENCE		
Biological Science	14	23
Chemistry	36	81
Computer Science	4	52
Earth and Environmental Science	14	32
Materials Science	37	67
Mathematics and Statistics	30	22
Psychology	37	24
Science Administration	1	23
Science, other	33	41
Other areas		
Educational Administration	6	37
Other Administration	5	46
Nonscience, other	22	38

TABLE XII. Major subfields of decline and growth between degree and current work.

Selected subfields	Percent change degree-work	Degree number	Work number
DECLINE			
Nuclear Physics	−58	227	95
Atomic and Molecular Physics	−52	133	64
Elementary Particles	−49	158	31
Solid State Physics	−43	284	163
GROWTH			
Medical Physics	+136	28	66
Acoustics	+ 76	51	90
Fluid Dynamics	+ 60	20	32
Geophysics	+ 53	15	23
Optics	+ 44	82	118

TABLE XIII. Major fields and subfields of work by highest degree.[a]

	Ph.D. %	Masters %	Bachelors %
PHYSICS AND ASTRONOMY	67	60	50
Major Physics subfields of work	Solid State Physics Astronomy Physics Education (Coll) Nuclear Physics Elementary Particles Plasma Physics	Physics Education (SS)[b] Acoustics Physics Education (Coll)[b] Optics	Acoustics Optics Vacuum Science
ENGINEERING	11	21	29
OTHER SCIENCE	22	20	21
Total known	1585	360	162

[a]Graduate students not included.
[b]SS—Secondary Schools, Coll—College.

TABLE XIV. 1979 Salaries by type of employer (in thousands of dollars).

	Mean	Median	Number responding
University	25.1	24.0	739
College	20.5	18.5	90
Junior college	21.4	20.0	36
Secondary school	18.7	19.0	100
Industry	33.7	31.5	579
Government	33.7	32.9	247
FFR&DC	31.3	30.0	206
Nonprofit	31.2	27.2	43
Self-employed	35.0	30.3	44
Other	30.0	28.0	21

TABLE XV. 1979 Salary by level of highest degree (in thousands of dollars).

	Median	Mean	Standard deviation[a]	Number of respondents
Ph.D.	28.0	29.6	11.3	1525
Masters	24.0	25.6	10.4	379
Bachelors	28.9	29.1	13.6	174

[a]Mean ± one standard deviation (SD), would cover 67% of the society members' salaries if salaries were normally distributed. The difference between the mean and the median reflects the skewness in the distribution. The median, which is not affected by extreme values, is usually considered the more reliable figure.

TABLE XVI. 1979 Salary by years from highest degree—Ph.D. (in thousands of dollars).

	Median	Mean	Standard deviation	Number of respondents
0–4	20.9	21.0	6.9	284
5–9	26.0	25.8	7.4	345
10–14	29.0	29.8	9.5	309
15–19	32.0	32.9	9.1	220
20–24	36.0	38.1	11.8	149
25 +	35.0	37.6	13.9	218

TABLE XVII. 1979 Industrial salaries by level of highest degree (in thousands of dollars).

	Mean	Median	Number of respondents
Ph.D.	35.7	34.0	350
Masters	29.8	28.9	121
Bachelors	31.9	30.0	94

TABLE XVIII. Society cross membership.

Society	Original sample size	Percent belonging to one or more AIP member societies	Major societies of overlap*
AAPM	117	20	APS—15 AAPT—6
AAPT	730	36	APS—31 OSA—6
AAS	265	22	APS—17 AAPT—5
ACA	97	15	APS—14
APS	2309	20	AAPT—10 OSA—5
ASA	399	9	APS—6
AVS	223	27	APS—23 OSA—5
OSA	492	31	APS—24 AAPT—9
SoR	69	13	APS—10

*These are percentages of the society listed in column one who belong to selected other societies. Percentages are not additive since an individual may belong to more than one society.

TABLE XIX. Year of highest degree by society.

Society	1970–1979 %	1960–1969 %	Before 1960 %	Sample total known
AAPM	60	22	18	73
AAS	52	28	20	160
ASA	44	22	34	245
OSA	41	24	35	287
SoR	41	23	36	39
APS	38	31	31	1459
AVS	36	26	38	120
AAPT	35	37	28	466
ACA	31	35	34	51

TABLE XX. Society membership by type of employer.

	AAPM No. (%)	AAPT No. (%)	AAS No. (%)
University	34	160	74
Colleges	4	59	7
Junior colleges	—	32	1
Secondary schools	—	102	1
SUBTOTAL Academic	**38 (52)**	**353 (81)**	**83 (55)**
Industry and self-employed	8	47	19
Government	10	19	24
FFR&DC	2	10	17
Nonprofit organization and other	15	6	7
SUBTOTAL Nonacademic	**35 (48)**	**82 (19)**	**67 (45)**
Total known	73	435	150
No response*	1	30	10

	ACA No. (%)	APS No. (%)	ASA No. (%)
University	23	571	82
Colleges	—	38	4
Junior colleges	—	6	—
Secondary schools	—	6	—
SUBTOTAL Academic	**23 (49)**	**621 (46)**	**86 (36)**
Industry and self-employed	10	366	92
Government	9	154	36
FFR&DC	4	193	3
Nonprofit organization and other	1	22	19
SUBTOTAL Nonacademic	**24 (51)**	**735 (54)**	**159 (64)**
Total known	47	1356	236
No response*	3	104	10

	AVS No. (%)	OSA No. (%)	SoR No. (%)
University	16	72	16
Colleges	2	8	—
Junior colleges	—	—	—
Secondary schools	—	—	—
SUBTOTAL Academic	18 (16)	80 (37)	16 (40)
Industry and self-employed	86	124	21
Government	4	33	2
FFR&DC	6	10	1
Nonprofit organization and other	2	12	—
SUBTOTAL Nonacademic	98 (84)	179 (69)	24 (60)
Total known	116	259	40
No response*	4	28	2

*Includes unemployed students and retired.